

Literature Review

This literature review investigates four main topics associated with using app-based learning with high-achieving students in the Spanish classroom. First, there is a review of gifted learners and their learning traits. Second, there is an evaluation of student motivation, specifically focusing on high-achieving students. Third, there is a discussion of smartphones and their use in educational contexts. Last, there is an analysis of app-based learning in education, both in all content areas, and more specifically, World Languages with an emphasis on Duolingo. The literature matrix for this study can be found in Appendix A.

Gifted Learners

Historically, the term gifted has been synonymous with smart. According to Abraham Tannenbaum, the term has less to do with intelligence, but more with potential and a successful mix of elements (Colangelo & Davis, 1991). Rather than assess their educational abilities as children, gifted students should be identified by the characteristics that will cause them to develop into gifted adults. These characteristics are combined into five categories: a strong level of academic intelligence, capabilities that are uncommon for young students, abilities outside of the area of education, parental support in the home environment, and factors that simply cannot be controlled (Colangelo & Davis, 1991). These students are often identified in elementary school by simply the first identifier: general intelligence. Without the other traits, some students may be overlooked as gifted or may be identified incorrectly.

Once identified, gifted students share many common characteristics. Many gifted learners are accurately able to realistically gage their ability to complete an activity (Yun Dai, Moon, & Feldhusen, 1998). Whereas other students see themselves as able to complete tasks that are outside of their ability level, gifted learners can assess their skills more accurately than their

peers. This could be due to the fact that gifted learners see effort as important as part of success. According to Yun Dai et al. (1998), "...high achievers tend to believe that both effort and ability contribute to high achievement, whereas low achievers are more likely to overemphasize ability as being responsible for academic success and failure" (p. 50). Lower achieving students, who have had less successes in the classroom, attribute their lack of accomplishments to being "dumb" rather than mediocre work ethic. For many students, lack of intelligence is an easier conclusion to make. This conclusion leads to a self-fulfilling prophesy for many students: by not trying, say students, they cannot fail. Inversely, gifted students are more likely to attribute their failure to a lack of effort.

If these gifted learners choose not to use all of their traits, they may become stagnant in their intellectual growth. When this growth plateaus, students tend to be categorized as underachievers. These students may earn straight A's, but are still not achieving at the levels expected of them by educators. Reis and McCoach (2000) have developed a screener based on the following definition of underachievers: "students who exhibit a severe discrepancy between expected achievement (as measured by standardized achievement test scores or cognitive or intellectual ability assessments) and actual achievement (as measured by class grades and teacher evaluations)" (p. 157). Without interventions, these students may never reach their true potential.

There are many factors that can lead to underachievement, but interactions internally and with family and peers may be common elements in the profile of the average underachiever. Internally, students may feel fear that they will fail to live up to their "smart" label. These students may see competition as a threat and therefore, may shy away from challenging material as to not be embarrassed (Reis & McCoach, 2000). This fear of failure can also be reinforced in the family unit. Parents who impose too severe or overly indulgent expectations are more likely

to have gifted students who are classified as underachievers. Households with underachievers are also more focused on penalties when expectations are not met (Reis & McCoach, 2000). This family climate could be a factor in the internal conflict which stems from failure. With more advanced material or tasks, the proverbial fall due to failure is much higher. If students are afraid to disappoint parents or other family members, they may be less likely to attempt higher-level achievement. Peers can also cause these reservations. Friend groups have a great effect on student success. Even though many students' friend groups mirror their ability groupings in school settings, peer acceptance still affects gifted students and their willingness to achieve at high levels (Reis & McCoach, 2000). After reviewing the research, gifted learners need to feel challenged in order to keep achieving at high levels. They must also sense the safeness in their environments in order to not fear failure. Parents and peers can control the mindset of gifted learners and need to be considered when planning curriculum for these students. Next, the literature pertaining to student motivation will be discussed.

Motivation

Student motivation is an area in education that is difficult to quantify, as motivation changes from student to student and from subject to subject. As Colangelo and Davis (1991) note, "Exceptional performance in a particular field stems largely from an intense and prolonged investment of energy" (p. 72). Students who are motivated put in the time and effort in a subject in order to be successful in that field of study.

Motivation can be extrinsic, intrinsic, or a mixture of both. Extrinsic motivation is when people, most specifically students, are motivated by rewards or punishments (extrinsic regulation), motivation from peers (introjection), giving personal value to different activities (identification), and goal setting and analysis (integration) (Ryan & Deci, 2000). Extrinsic

motivation materializes differently based on gender. While male students look for motivation from beating other students in test scores, grades, etc., female students are more motivated by activities that allow socialization rather than competition (Colangelo & Davis, 1991). In today's educational system, motivation comes from many extrinsic sources. This focus on the extrinsic creates students with good grades, but little motivation to learn without an outside motivator.

Intrinsic motivation comes from within a student's mind for their own benefit rather than using outside factors as a measuring stick. Each person has differing amounts of intrinsic motivation for each specific skill or task. Without extrinsic motivation, the ability to complete a task or master a skill must be the motivating factor according to Skinner's operant theory research (Ryan & Deci, 2000). By this research, if there is no grade determining a student's success, then the student must be internally motivated to do well in a subject area.

With gifted students, there is often a problem with this intrinsic motivation. In a classroom, gifted learners will master content faster than others and are less apt to find school thought-provoking or difficult (Dixon & Moon, 2006). Since these students have already met proficiency, teachers should allow gifted learners to do challenging work to raise their proficiency levels. Many times, when there is not a grade attached to their "above and beyond" work, students see little reason to master these extra skills. Therefore, gifted learners should be encouraged to be self-regulated learners. According to Ablard and Lipschultz (1998), students who are considered self-regulated "engage in academic tasks for personal interest and satisfaction and are metacognitively and behaviorally active participants in their own learning" (p. 94). Gifted learners need to be self-regulated in order to accept challenging work that appeals to the intrinsic side. In order to challenge gifted learners, teachers can use ability grouping, allow students to choose their path for different skill sets, plan a variety of tasks that foster student

growth in many avenues, and should not use competition as a motivational factor with these students since competition fosters the development of extrinsic motivators. By giving these students straightforward critiques and showing a true passion for their subject field, students can begin to internalize the motivators to succeed in a certain subject area (Dixon & Moon, 2006).

Self-regulation and inquiry-based learning go hand in hand while instructing gifted learners. Students who self-regulate are adept at organization, record keeping, research, and analysis (Ablard & Lipschultz, 1998). All of these factors can be built upon while using an inquiry-based curriculum. Inquiry learning, which is based on the concept of students being the designers of the learning process in the classroom, requires students to form a hypothesis, research and analyze information for relevance, and ask high-level questions (Robinson, Shore, & Enersen, 2007). Inquiry-based learning often encourages the use of technologies as tools to motivate and guide learners. The skills gained through inquiry learning can be transferred to any classroom and can open doors for gifted learners to find areas of study in all subject areas, therefore fostering intrinsic motivation in this group of students.

After reviewing the literature, gifted learners are highly motivated by extrinsic motivators. Educators and parents both need to help these learners gain intrinsic motivators in order to be highly successful. By working with gifted learners on becoming self-regulated learners, educators can help these students see the benefits of going above and beyond classroom content. Inquiry-based learning can also help these students gain these skills. The following literature will review the inclusion of smartphones in education.

Smartphones in Education

One of the technologies that can be best utilized in the classroom is the smartphone. Traditionally, teachers have seen cell phones as a hindrance to learning. Many students do not see their devices as being inherently educational, so they tend to focus more on the social aspect of the smartphone (Woodcock, Middleton, & Nortcliffe, 2012). Students who were allowed to use their cell phones in a lecture-style class were found to score significantly lower on standardized classroom assessments (13 percentage points) than students who were not using their devices. These cell phone users were also less likely to answer open-ended questions with an exemplary answer (Kuznekoff & Lattenman, 2013). Students who are cell phones users in a lecture classroom, most specifically a university environment, get lower grades and retain less information.

Cell phones in the classroom can also pose a security risk when students log into a school network on their phone. As the majority of students leave apps logged in on their devices, including banking apps, social networks, and email (Jones, Goyal Chin, & Aiken 2014), security concerns for the network and for individual students are high on a relatively open school network. Students are widely unaware of these issues and little instruction is available to them at the secondary or post-secondary level on phone and internet security (Jones et al., 2014). In order for these technologies to be effectively used in the classroom, students need to be made aware of security risks and given tools to protect their personal information.

Even with these known challenges, smartphones can be successfully utilized in the classroom. The basic functions like calculators, calendars, and video can be used in both general situations and for educational purposes (Sykes, 2014), but there are apps that can be specifically helpful in the classroom. Colleges and universities use phones to give students information via their student management systems. Secondary classrooms utilize online polling software, games,

and surveys to elicit recall and analysis from students (Jones et al., 2014). Most students are interested in using smartphones in an educational setting. One study determined that 46% of students already utilized their smartphones for learning and 75% of the non-users were interested in using smartphones for educational purposes (Woodcock et al., 2012). Students are seeing and experiencing mobile technologies that can be used in the world outside of education. By having interactions with these apps as students, they can more effectively utilize the technologies in the workplace, especially in the professional fields (Sykes, 2014).

In order to effectively use smartphones in the classroom, student ideas and concerns need to be taken into consideration in the development process. For the technology to be useful, discussion needs to include the opinions of the users/students. As a part of his research study, Sykes (2014) found that students wanted to be able to use Android devices along with the Apple iOS system used in the study. These preferences are key for student usage.

It is clear that when choosing to utilize smartphones in education, the curriculum and device used also needs to be developed with students in mind. If a student learning system is poorly designed, students will not use it (Woodcock et al., 2012) and will lose any of the benefits that could be gained through the technology. In order to effectively employ smartphones in the classroom, students need to see the benefit of using the technology, to be properly trained how to minimize any inherent security risk, and teachers need to adjust their methods of instruction in order to properly include the use this type of technology. The next section will review the literature surrounding specific applications created for education.

Use of Smartphone Applications in the Classroom

The area in technology of smartphone apps for education is a quickly growing field with many different facets that need to be created and adjusted for each specific subject and classroom. The demand for this technology means there needs to be a strong base of technology to build off of (Khaddage & Lattenman, 2013), but the field is growing so quickly, it is difficult to find this foundation.

The most common used apps in the classroom are student learning systems, like Blackboard or Moodle, quiz or testing apps like Quizlet or Quia, language apps, such as Duolingo or dictionaries/translators, and apps specific to a field of study (Khaddage & Lattenman, 2013). Most subject areas have apps that are built to help students complete classwork and study content outside of the classroom. These apps can also be used in authentic situations in the workplace (Libman & Huang, 2013). Students in numerous studies have seen the benefits to incorporating apps into their curriculum, due to the ease factor and the ability to communicate with other students and instructors. (Khaddage & Lattenman, 2013; Vázquez-Cano, 2014).

Yet, many teachers have yet to formally include these technologies into the classroom. Many students already use apps for educational purposes, but do not see these technologies actually being used in the classroom (Khaddage & Lattenman, 2013). Many schools do not see the need for including these pieces of technology in the curriculum. “The surveyed students complained that they do use mobile apps in an informal way and outside their learning context and their university...and, thus, teachers and administrators are yet to formally integrate and implement these apps to help their students learn” (Khaddage & Lattenman, 2013, p 126). This could be due to a lack of training on devices. Most teachers have never been trained on using

apps in the classroom. Instead, discovery happens when one teacher finds an interesting app and shares with colleagues. This informal instruction can lead to holes in knowledge bases and therefore, hinders usability in the classroom.

After reviewing the literature, it seems that content-specific apps are found to be more helpful by both teacher and student and can “transform the landscape” (Libman & Huang, 2013, p. 325) of the classroom. Proper training and research needs to be done before and during use in the classroom. Teachers need to be current with content-specific apps that can enhance instruction and can be used as study tools outside of the classroom. The final section will study the use of phone applications to teach world languages.

Use of Applications in the World Language Classroom (Duolingo)

Learning a world language in a classroom setting is always difficult due to the lack of immersion in the language. Secondary students use the language for less than 10,000 minutes in a school year. Smartphone apps can be a helpful tool for students to “bring language” along with them outside of the classroom. The accessibility and convenience factors allows students to see a quick way to study or learn in a format that is opportune to them (Steel, 2012). These apps can be used not only in conjunction with a class, but can be used for learning outside a school environment for personal growth or enjoyment. These apps are prime tools due to their cost-effectiveness. They are also student-driven, so students may work at their own pace and can spend more time on difficult concepts while skipping through easier content (Godwin-Jones, 2011).

Effective apps for language learning include: Anki, Quizlet, Word Reference, Babbel, hello-hello, Conjugation Nation, and Duolingo (Godwin-Jones, 2011). These apps all use some

kind of vocabulary acquisition to increase reading abilities in varying ways (Steel, 2012). Most use grammatical concepts to increase writing ability. Of these already available apps, only Duolingo includes a speaking and listening component with the already discussed reading and writing skills. Duolingo uses a language placement test and a “tree” of learning to increase student fluency through the language of study. The app uses vocabulary matching, sentence building, picture identification, translation, and other speaking and listening activities to add lingots to a student’s profile. In studies, students have overwhelmingly stated that Duolingo is user-friendly and enjoyable (Munday, 2016).

Historically, in a world language classroom, students must speak in a large-group setting in order to have their speaking skills assessed. This setup leads to many students experiencing anxiety in the classroom. “If a learner is nervous when speaking and has feelings of apprehension, the learner will be less likely to use their language skills” (Ratzlaff, 2015). Duolingo offers an alternative for these students who are apprehensive to speak in the classroom environment. The speaking tool through Duolingo allows students to speak directly into the app and their speech is evaluated electronically. This can relieve language anxiety for shy or timid students.

There are some downfalls to using a software for language learning. Translation is a subjective field and all human translators see the flexibility of using different words in context. Computer-based translation does not recognize these situations. Also, some of the phrases and words taught by Duolingo seem to be out of context and unusable in authentic contexts (Jasková, 2014). Another factor in student success is the combination of the app with a classroom situation. When students try to learn a language using only the app they are much less likely to succeed.

When combined with in-class instruction, students could use the language much more effectively and had a higher level of enjoyment and success (Munday, 2016, Ratzlaff, 2015).

When given instruction through Duolingo, instructors need to be aware of its limitations and need to limit its representation of a student's grade (Munday, 2016). While a very helpful tool, it is yet unknown whether students retain information more effectively, or at all, after using an education app. Once a student has a basis in the language they should be able to use the app alone with few constraints.

After reviewing the literature, Duolingo has become the premier language learning app available due to its flexibility and many modes of communication. Although students should be encouraged to use the app in- and outside of the classroom, its benefits without classroom instruction are yet unknown. Duolingo will be a benefit to an already in place language classroom as a self-controlled and fun support.

Conclusion

This literature review illustrated how gifted learners often need tasks that challenge them in order to keep them from underachieving in the classroom. If these learners become more intrinsically motivated by using self-regulation techniques, they will be more likely to be highly successful learners. One way that these learners may develop these techniques is through smartphone applications. In the world language classroom, gifted students may be able to use Duolingo and other language apps to learn beyond the constraints of a traditional classroom setting at their own pace.